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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TRINH, THANH TRUC

ART UNIT

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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/553,030	Applicant(s) ABERLE ET AL.	
	Examiner THANH-TRUC TRINH	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2/16/07, 2/10/09</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 4-7, 11 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Marumoto et al. (JP 08-67535, see machine translation)

Regarding claims 1, 2, 5-7, 11 and 19, as seen in Figure 1, Marumoto et al. discloses a method of texturing a glass surface and glass surface formed by the method. The method omprises the steps of:

- coating the glass surface (see SiO₂ glass substrate 1 in Figure 1, paragraphs 0008-0009) of a material film (see layer 2 of Ni-5% aluminum in abstract, paragraphs 009 and 0016), wherein the glass surface initially flat (see glass substrate 1 in step 1 of Figure 1).
Noted that SiO₂ glass is quartz glass.
- stimulating a reaction at the interface between the glass and the material film resulting in the formation of reaction products at the interface (e.g. by way of thermal treatment or thermal annealing as layer 2 is formed by thermal spray, or coating followed by sintering, see paragraphs 0009, 0014)

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- removing the material film (e.g. layer 2) and the reaction products from the glass surface. (See step 3 of Figure 1, and paragraph 0010).

Regarding claim 4, Marumoto et al. teaches thermally spraying aluminum layer 2 under specific condition as seen in table 1. Therefore, the thermal annealing process is inherently conducted in a controlled ambient atmosphere.

3. Claim 1, 9-10, 12-18 and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Shi et al. (WO 00/28602, submitted in IDS by Applicant)

Regarding claims 1 and 9-10, as seen in Figures 1-9, Marumoto et al. discloses a method of texturing a glass surface comprising the steps of:

- coating the glass surface (see glass substrate 11 in Figure 1, paragraphs 0008-0009) of a material film (see deposition of BaSO_4 covering the surface of the glass, 2nd paragraph of page 5).
- stimulating a reaction at the interface between the glass and the material film resulting in the formation of reaction products at the interface (e.g. by way of the BaSO_4 covering the surface of the glass to a significant depth to be etched by HF, see 2nd paragraph of page 5
- removing the material film and the reaction products from the glass surface by chemical etching using HF (e.g. BaSO_4 being etched away by HF to form rugged surface on glass substrate 11, see 2nd paragraph of page 5, Figures 1-9)

Regarding claims 12-13, 17-18 and 20, as seen in Figures 1-9, Shi et al. teaches a method of manufacturing a photovoltaic device comprising the steps of

- texturing a glass surface (see textured surface 12 of glass substrate 11 utilizing a method in claims 1 and 9-10 above (see page 5)
- depositing a semiconductor film of amorphous or crystalline silicon (see silicon layer 15 in figures 1-9, see abstract and page 2 lines 28-30,) on the textured glass surface (e.g. 12), wherein the glass-facing surface of the semiconductor film exhibits substantially the same degree of texture as the glass surface (see Figures 1-9). The semiconductor film is deposited in a manner such that substantially no gaps or voids exist between the textured glass surface and the semiconductor film. (as Shi et al. depicts no gaps or void between the textured glass surface 12 and the semiconductor film in Figures 1-9)

Regarding claims 14-16, Shi et al. discloses a method of making a photovoltaic device as described in claim 12 above. Shi et al. further discloses forming a dielectric barrier layer of silicon nitride (see barrier 31) between the glass (11) and the semiconductor (15) prior to the deposition of the semiconductor film (see the last paragraph of page 4).

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Regarding claim 21, as seen in Figures 1-9, Shi et al. teaches photovoltaic device comprising:

- a glass pane (see glass substrate 11 in Figures 1-9, abstract) having a textured surface (see texture surface 12 in Figures 1-9, abstract); and
- a semiconductor film (see silicon film 15 in Figures 1-9, abstract) formed on the textured surface of the glass pane.

Shi et al. teaches all the structural limitations of the claims; therefore the reference is deemed to be anticipatory. The limitation "a semiconductor film having an internal absorption efficiency greater than about 0.5 for photons in a wavelength range from about 600 to 1200 nm" is an inherent property of Shi et al's photovoltaic device, particularly in view of the fact that Shi et al. using the same material (e.g. silicon) applied onto a textured glass surface as Applicant. Recitation "a semiconductor film having an internal absorption efficiency greater than about 0.5 for photons in a wavelength range from about 600 to 1200 nm" is directed to specific properties of the silicon semiconductor film, it is noted that once a semiconductor film is disclosed to be silicon, and therefore is substantially the same as the semiconductor film of claim 21, it will, inherently, display recited properties. See MPEP 2112.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marumoto et al. (JP 08-67535, see machine translation) as applied to claims 1-2, 4-7, 11 and 19 above, in view of Oboodi et al. (US Patent 4794048).

Regarding claims 3 and 8, Marumoto et al. discloses a method of texturing a glass surface as set forth above, wherein the material film of metal is formed on

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the glass surface by spin coating, doctor blade or screen printing and followed by sintering treatment.

Marumoto et al. does not specifically teach the thermal annealing process comprising a sequence of annealing steps at different temperatures (claim 3), or the reaction product comprising aluminum oxide and/or silicon (claim 8).

Oboodi et al. teaches bonding a metal film (e.g. 18) onto a glass surface (e.g. 16) by screen printing and followed by sintering (e.g. corresponding to instant thermal annealing process), wherein the sintering step (or thermal annealing process) comprises a sequence of annealing steps at different temperatures (See Figure 3, col. 7 lines 14-36, col. 5 lines 25-27, col. 14 line 40 through col. 15 line 30, col. 8 line 36 through col. 14 line 39). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Marumoto et al. by thermally annealing the glass and the material film of metal with a sequence of annealing steps at different temperature as taught by Oboodi et al, because Oboodi et al. teaches the thermal annealing process can be carried out in a single step or in multiple steps, wherein the multiple steps are preferred (See col. 13 lines 28-30), so that the binder and solvent in the suspension (e.g. used in the printing process, see col. 11 lines 48-64) can be removed. (see col. 14 line 40 through col. 15 line 30; col. 8 line 36 through col. 14 line 39). While the reaction product of aluminum bonding to SiO_2 glass substrate comprising aluminum oxide and/or silicon is not explicitly disclosed, it would have been inherent to the method of modified Marumoto et al.

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as evidenced by Applicant's specification (see Applicant's specification, pages 2 and 4).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THANH-TRUC TRINH whose telephone number is (571)272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on 571-272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TT
1/19/2010

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 1795